

# **Cedar Mountain Solar and Solar Logic Present...**

## **A Solar Thermal Training Intensive**

Practical Solar Heating Design Guidelines for Professional Installers

Basic (1 Day): The fundamentals of solar hydronic heating systems will be covered including collector orientation and tilt, drainback vs. closed loop pressurized systems, AC vs. DC circulators, overheat protection and system sizing for tanks and collectors. Solar DHW and its common components will be the focus of this class. At the end of the class, the successful student will be able to size tank and solar collectors for standard residential DHW applications, be knowledgeable of overheat protection for solar systems and know basic plumbing layout for several types of solar hot water system. This class requires no pre-requisites.

Main course (2 Days): Making the transition from Solar DHW to Solar Hydronic Combi systems using closed-loop glycol collector systems. Solar heating for the whole home will be discussed with the focus on how to connect multiple heating sources and multiple heating loads together in a systematic way, and how to control them. This workshop will include innovative energy efficient control methods and how they can be most easily applied using certain standard piping strategies that can be expanded and duplicated. Working examples will be presented of systems using primary loops, flow separators, modular pump stations and modular manifolds as design options. The logic of how solar heat effects boiler usage and how heat storage and heating loads can be prioritized will be covered. Basic programming and troubleshooting of some common solar controls will be included. At the end of the class, the successful student will be able to understand the principles of good solar hydronic design and be able create designs that include the basic controls for solar systems with multiple heating sources (solar with backup) for multiple heating loads. Course pre-requisites are either the Basic Solar class (above) or actual hands-on experience with solar systems.

Advanced (1 Day): This class will continue with the discussion of more advanced whole home heating systems and controls. It will introduce solar assisted ice melt, spa and pool heating, and using collector panels for night sky radiant cooling. Troubleshooting systems will play a large role in the class. These advanced controls are capable of utilizing radiant mass floors as both heat storage and overheat protection. In this advance course, the successful student will gain a deeper level of understanding of solar hydronic system controls and using glycol loops for heating multiple outdoor loads and radiant night cooling. Pre-requisite: Main Course (above)